Claims

What is claimed is:

1. A method of making optical fluoride crystal feedstock, comprising:
loading a fluoride raw material in powder form into a flexible mold; and
applying isostatic pressure to the mold to compress the fluoride raw material.

2. The method of claim **1**, further comprising mixing a fluorinating agent in powder form with the fluoride raw material prior to applying isostatic pressure to the mold.

3. The method of claim **1**, wherein isostatic pressure is applied to the mold at ambient temperature.

4. The method of claim **1**, further comprising evacuating air out of the mold prior to applying isostatic pressure to the mold.

5. The method of claim **1**, further comprising melting the compressed fluoride raw material and solidifying the melt to form a solid pre-melt body.

6. The method of claim **5**, further comprising crushing the solid pre-melt body and storing the crushed pre-melt in an inert atmosphere.

7. The method of claim **1**, wherein the fluoride raw material comprises a metal fluoride selected from the group consisting of CaF_2, BaF_2, MgF_2, SrF_2, LiF, NaF, M_3AlF_6, and $(M_1)_x(M_2)_{1-x}F_2$, and mixtures thereof, and where M is selected from the group consisting of Li, Na, K, Rb, and Cs, M_1 and M_2 are selected from the group consisting of Ca, Br, Mg, Sr, Li, Na, and lanthanide series metal fluorides, and x is in a range from 0 to 1.

8. The method of claim **7**, wherein the fluoride raw material further comprises a lanthanide series metal fluoride mixed with the metal fluoride.

9. The method of claim **1**, further comprising storing the compressed fluoride raw material in an inert atmosphere.

10. A method of making an optical fluoride crystal, comprising:
loading a fluoride raw material in powder form into a flexible mold;
applying isostatic pressure to the mold to compress the fluoride raw material;
loading the compressed fluoride raw material into a crucible; and
growing a crystal by melting the compressed fluoride raw material inside the crucible and moving the crucible through a thermal gradient.

11. The method of claim **10**, further comprising mixing a fluorinating agent in powder form with the fluoride raw material prior to applying isostatic pressure to the mold.

12. The method of claim **10**, wherein isostatic pressure is applied to the mold at ambient temperature.

13. The method of claim **10**, further comprising evacuating air out of the mold prior to applying isostatic pressure to the mold.

14. The method of claim **10**, wherein the fluoride raw material comprises a metal fluoride selected from the group consisting of CaF_2, BaF_2, MgF_2, SrF_2, LiF, NaF, M_3AlF_6, and $(M_1)_x(M_2)_{1-x}F_2$, and lanthanide series metal fluorides, and mixtures thereof, and where M is selected from the group consisting of Li, Na, K, Rb, and Cs, M_1 and M_2 are selected from the group consisting of Ca, Br, Mg, Sr, Li, Na, and lanthanide series metal fluorides, and x is in a range from 0 to 1.

15. The method of claim **14**, wherein the fluoride raw material further comprises a lanthanide series metal fluoride mixed with the metal fluoride.

16. A method of making an optical fluoride crystal, comprising:
loading a fluoride raw material in powder form into a flexible mold;
applying isostatic pressure to the mold to compress the fluoride raw material;
melting the compressed fluoride raw material and solidifying the melt to form a solid pre-melt body;
crushing the solid pre-melt body; and
growing a crystal by melting the crushed pre-melt and moving the melt through a thermal gradient.

17. The method of claim **16**, further comprising mixing a fluorinating agent in powder form with the fluoride raw material prior to applying isostatic pressure to the mold.

18. The method of claim **16**, wherein isostatic pressure is applied to the mold at ambient temperature.

19. The method of claim **16**, further comprising evacuating air out of the mold prior to applying isostatic pressure to the mold.

20. The method of claim **16**, wherein the fluoride raw material comprises a metal fluoride selected from the group consisting of CaF_2, BaF_2, MgF_2, SrF_2, LiF, NaF, M_3AlF_6, and $(M_1)_x(M_2)_{1-x}F_2$, and lanthanide series metal fluorides, and mixtures thereof, and where M is selected from the group consisting of Li, Na, K, Rb, and Cs, M_1 and M_2 are selected from the group consisting of Ca, Br, Mg, Sr, Li, Na, and lanthanide series metal fluorides, and x is in a range from 0 to 1.